DIA EDGE
TOOL NEWS
2021.5 Update
B248G

Taper Ball Nose End Mills for Machining Aluminium Alloy Impellers

DLC4LATB/C4LATB

Series Addition

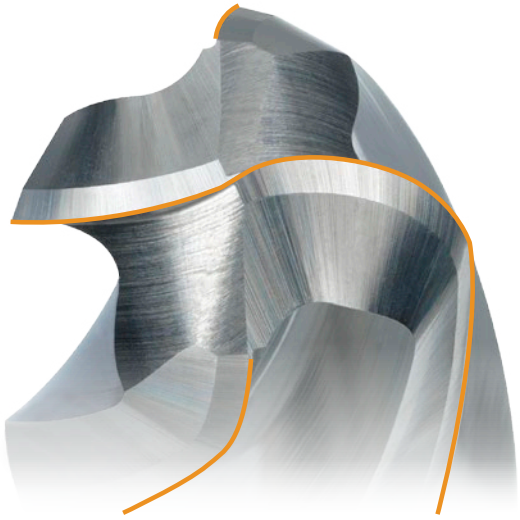
Rigid Design and New DLC Coated Type for High Efficiency, Reliable Machining of Aluminium Impellers

MITSUBISHI MATERIALS CORPORATION

Taper Ball Nose End Mills for Machining
Aluminium Alloy Impellers

DLC4LATB/C4LATB

Featuring 4 peripheral flutes for strength and rigidity but with only 2 ball end flutes for superior chip discharge.



— : Cutting Edge

A wide range of non-standard shapes are available. Please inquire for more information.

Ball Nose Taper End Mill

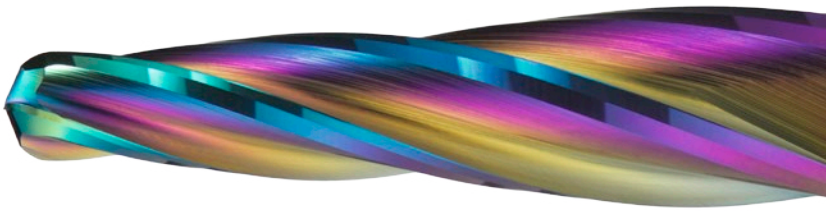
C4LATB

First Recommendation

NEW

DLC Coated Ball Nose Taper End Mill

DLC4LATB



The uniquely developed DLC coating provides excellent welding resistance during high speed machining and when the coolant supply is reduced. Additionally, the low coefficient of friction reduces cutting resistance.

Application Example

High Efficiency Machining of Aluminium Alloy Impellers

Excellent high depth of cut and feed.

Conventional

Breakage During Machining

C4LATB

High Durability

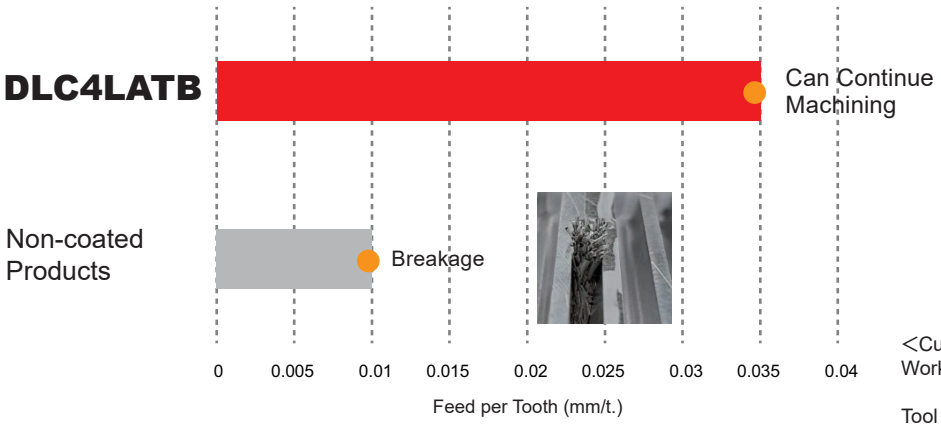
<Cutting Conditions>

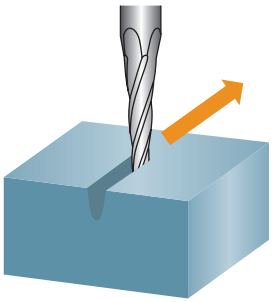
Workpiece Materiall	: Aluminium Alloy (A2618-T61)	Max. Feed Rate	: 2000 mm/min
Tool	: C4LATBR100T040AP20	Max. Depth of Cut	: ap = 11.0 mm
Revolution	: 20000 min^{-1}	Cutting Mode	: Water Based
		Machine	: Vertical M/C

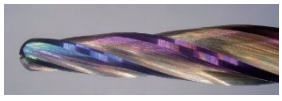
Cutting Performance

Slotting with a Limited Coolant Flow Rate

Resistance to welding prevents tool breakage when coolant supply is limited due to the geometry of the workpiece.







DLC4LATB

Non-coated Products

<Cutting Conditions>

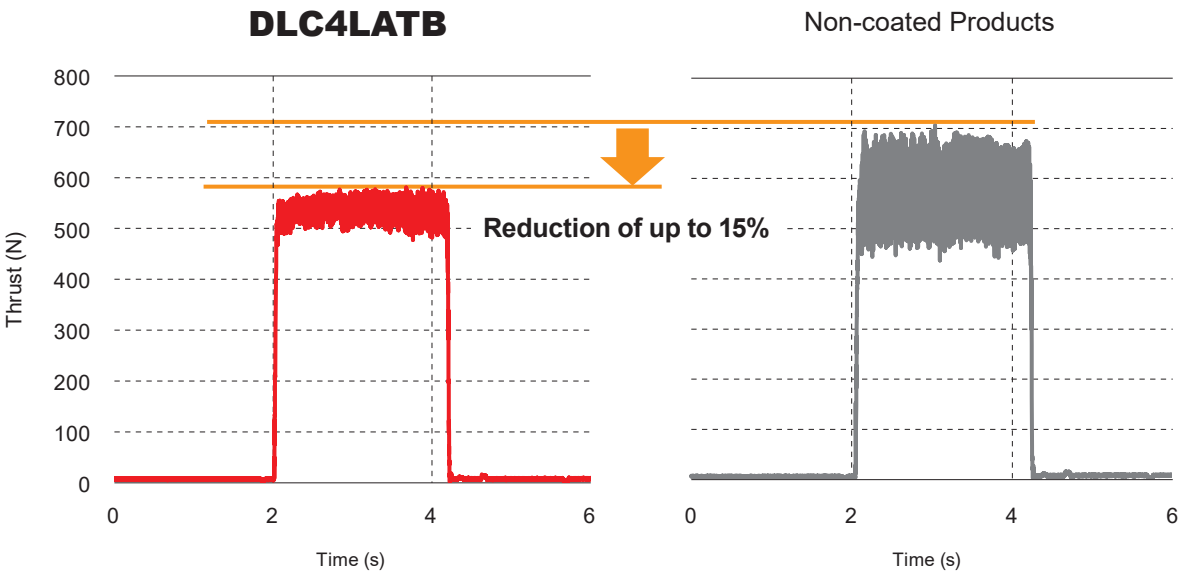
Workpiece Material	: Aluminium Alloy (A2618-T61)
Tool	: DLC4LATBR100T040AP20 R1×4°
Revolution	: 20000 min^{-1}
Feed per Tooth	: fz = 0.005-0.035 mm/t.
Depth of Cut	: ap = 10 mm
Cutting Mode	: Wet Cutting (Emulsion) External Coolant
Machine	: Vertical M/C (BT30)

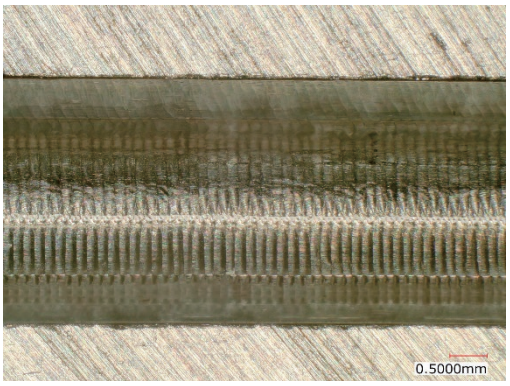
This test was performed with a limited coolant flow rate. If the coolant flow rate is sufficient, non-coated end mills can also be used.

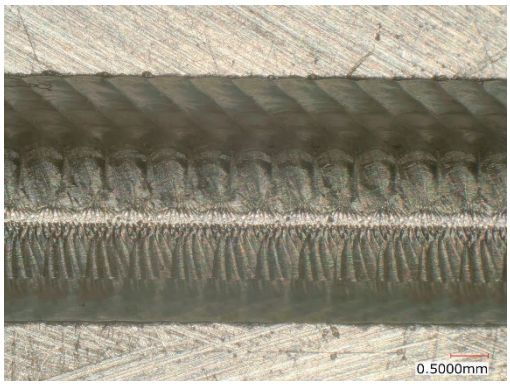
Cutting Performance

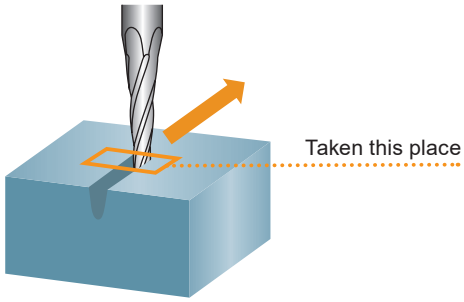
Comparison of Cutting Resistance when Slotting

Cutting resistance has been reduced by up to 15% compared to non-coated products.









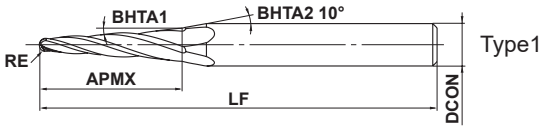
<Cutting Conditions>

Workpiece Material	: Aluminium Alloy (A2618-T61)
Tool	: DLC4LATBR100T040AP20 R1×4°
Revolution	: 20000 min^{-1}
Feed per Tooth	: fz=0.035 mm/t.
Depth of Cut	: ap=10 mm
Cutting Mode	: Wet Cutting (Emulsion) External Coolant
Machine	: Vertical M/C (BT30)

DLC4LATB NEW

Ball nose taper end mill, Long cut length, 4 flute, For aluminium impellers

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
							◎



Type1

Type2

RE≤2				
± 0.010				
±5'				
DCON=6	DCON=8			
0 - 0.008	0 - 0.009			

● The high-rigidity design with improved breakage resistance achieves high-efficiency machining of aluminium alloy impellers.
● High resistance to welding when there is an insufficient coolant supply or during high-speed cutting.

(mm)

Order Number	RE	BHTA1	APMX	LF	DCON	* No.F	Stock	Type
DLC4LATBR050T040AP20	0.5	4°	20	70	6	4	●	1
DLC4LATBR100T040AP20	1	4°	20	70	6	4	●	1
DLC4LATBR150T040AP20	1.5	4°	20	75	8	4	●	1
DLC4LATBR200T040AP30	2	4°	30	75	8	4	●	2

* Number of Flutes
Note 1) A wide range of non-standard shapes are available. Please inquire for more information.
(Ex. Different coatings or RE sizes, of a minimum R0.3 and taper half angles.) or coatings.

RE = Radius of Ball Nose
BHTA1 = Taper Angle
APMX = Length of Cut
LF = Overall Length
DCON = Shank Dia.

● : **Inventory maintained in Japan.**

Taper Ball Nose End Mills for Machining Aluminium Alloy Impellers

C4LATB

Ball nose taper end mill, Long cut length, 4 flute, For aluminium impellers

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
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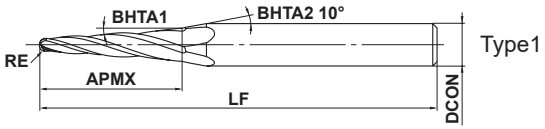

Type1

Type2

RE≤2				
± 0.010				
±5'				
DCON=6	DCON=8			
0 - 0.008	0 - 0.009			

● The high-rigidity design with improved breakage resistance achieves high-efficiency machining of aluminium alloy impellers.
● First recommended for machining aluminium alloy impellers.

(mm)

Order Number	RE	BHTA1	APMX	LF	DCON	* No.F	Stock	Type
C4LATBR050T040AP20	0.5	4°	20	70	6	4	●	1
C4LATBR100T040AP20	1	4°	20	70	6	4	●	1
C4LATBR150T040AP20	1.5	4°	20	75	8	4	●	1
C4LATBR200T040AP30	2	4°	30	75	8	4	●	2

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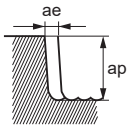
DLC4LATB/C4LATB

Ball nose taper end mill, Long cut length, 4 flute, For aluminium impellers

Recommended Cutting Conditions

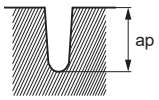
■Side Milling

(mm)

Workpiece Material	Aluminium Alloys			
R **RE**	Revolution (min^{-1})	Feed Rate (mm/min)	Depth of Cut ap	Depth of Cut ae
R0.5	20000	2000	15	0.75
R1	20000	4000	15	1.5
R1.5	20000	5200	15	2.25
R2	20000	5200	23	3
Depth of Cut				

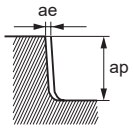
■Slotting

(mm)

Workpiece Material	Aluminium Alloys		
R **RE**	Revolution (min^{-1})	Feed Rate (mm/min)	Depth of Cut ap
R0.5	20000	600	10
R1	20000	2800	10
R1.5	20000	4000	10
R2	20000	4000	15
Depth of cut			

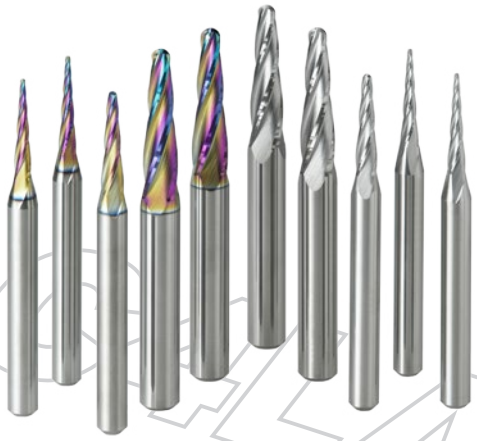
■Side Milling (Finishing)

(mm)

Workpiece Material	Aluminium Alloys			
R **RE**	Revolution (min^{-1})	Feed Rate (mm/min)	Depth of Cut ap	Depth of Cut ae
R0.5	20000	800	18	0.1
R1	20000	2000	18	0.2
R1.5	20000	2400	18	0.3
R2	20000	2400	27	0.3
Depth of Cut				

Case Examples for Non-standard Shapes

Note 1) Water-soluble cutting fluid is recommended.
Note 2) Climb cutting is recommended for side milling.
Note 3) If the rigidity of the machine or the work materials installation is very low, or chattering and noise are generated, reduce the revolution and feed rate proportionately, or set the depth of cut smaller.



Taper Ball Nose End Mills for Machining Aluminium Alloy Impellers

DLC4LATB/C4LATB

For Your Safety
●Don't handle inserts and chips without gloves. ●Please machine within the recommended application range and exchange expired tools with new ones in advance of breakage. ●Please use safety covers and wear safety glasses. ●When using compounded cutting oils, please take fire precautions. ●When using rotating tools, please make a trial run to check run-out, vibration and abnormal sounds etc.

MITSUBISHI MATERIALS CORPORATION

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(Tools specifications subject to change without notice.)

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2021.5.E(-)